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AUTHOR Butkowsky, Irwin S.; Willows, Dale M.
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ABSTRACT

Employing a cognitive/motivational analysis, a study was undertaken to determine some specific self-perceptions that might contribute to motivational and performance deficits observed in children with reading difficulties. A total of 72 children of relatively good, average, and poor reading ability were assessed on tasks in which success and failure were manipulated. Consistent with predictions, poor readers displayed characteristics indicative of learned helplessness and low self-concepts of ability. These included significantly lower initial estimates of success, less persistence, attribution of failures to lack of ability and successes to factors beyond personal control, and greater decrements in expectancy of success following failure. (Author/FL)

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Learned Helplessness in Children with Reading Difficulties

Irwin S. Butkowsky and Dale M. Willows

University of Waterloo

Paper presented at the AERA Annual Meeting, San Francisco, California, April, 1979.

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Abstract

Employing a cognitive-motivational analysis, the present investigation sought to determine some specific self-perceptions that might contribute to motivational and performance deficits observed in children with reading difficulties. Children of relatively good, average and poor reading ability were assessed on tasks in which success and failure were manipulated. Consistent with predictions, poor readers displayed characteristics indicative of learned helplessness and low self-concepts of ability. These included significantly lower initial estimates of success, less persistence, attribution of failures to lack of ability and successes to factors beyond personal control, and greater decrements in expectancy of success following failure. Implications for education and reading remediation are discussed.

Educators, clinicians, and researchers of various theoretical persuasions have long recognized a relationship between self-concept and school performance. Although an adequate level of intellectual ability is essential to academic achievement, how children feel about their potential for success in school may also be an important determining factor (see Purkey, 1970 for a review). Children with learning difficulties represent a special population in which the critical role of the relationship between self-concept and school achievement has been implicated (e.g. Andrews, 1966; Johnson & Morasky, 1977; Mordock, 1975). In one particularly important area of academic functioning, that of reading, extensive evidence has linked negative self-perceptions and low levels of self-concept, self-esteem, and self-confidence to low levels of performance and persistence on reading tasks (see Spache, 1976 for a review). It is not clear from this literature, however, whether a low self-concept and negative self-perceptions are causes, effects, or both, of low levels of academic functioning. Indeed, studies that have directly examined this issue have yielded equivocal findings, supporting all three possibilities (e.g. Black, 1974; Bridgeman & Shipman, 1978; Wattenberg & Clifford, 1964). More importantly, this literature does not provide us with any specific characterization of the mechanisms that might mediate between these personality characteristics and subsequent school performance, nor does it specify to any satisfactory degree what functional components a "self-concept" might include. The present research sought to

shed light on these issues by providing some empirical evidence on the relationships of certain behavioural and cognitive measures (said to relate to the construct of self-concept) to competence in one area of academic performance; that of reading.

Self-concept as integrated in a model of behaviour change

Within the context of the present research, self-concept can best be viewed as a kind of cognitive "metastructure" consisting of a set of cognitive structures or cognitions (beliefs, attitudes, attributions and the like) that children hold about themselves. These are derived from the child's interaction with the environment and may be global, as in measures of overall self-esteem, or specific, as in the child's self-concept of ability in a particular academic subject. The notion of "cognitive structure" employed here is consistent with that of Meichenbaum (1977) who defined it as "that organizing aspect of thinking that seems to monitor and direct the strategy, route and choice of thoughts...." (p.283). In the cognitive-behavioural model proposed by Meichenbaum (1977), behaviour change is said to occur through a sequence of mediating processes involving the interaction of inner speech (what individuals say to themselves before, during, and following their behavior), the cognitive structures that give rise to the specific inner speech, and behaviour and its consequences. In the present context then, self-concept might be thought of as reflecting "what you say to yourself about yourself". Children with a particular problem in learning might develop (through repeated failures) a cognitive

structure based on the belief that they are incompetent in a particular area. This negative "self-concept" would reflect itself in the child's inner speech as he or she approached a task and while engaged in it, especially if confronted with failure. These negative self-statements would then serve as a self-fulfilling prophecy that would further reconfirm the child's belief and initial inner speech. A "deteriorating performance cycle" would thus be established and reinforced (Meichenbaum, 1975). Such a belief system might also result in motivational deficits (e.g. lack of persistence) or be inappropriately generalized to other academic areas.

Working within this conceptual framework then, the authors searched the literature for variables and constructs that might comprise that set of cognitive structures salient in the relationship of self-concept and academic performance.

Perceived causes of success and failure, expectancies, and persistence

Attribution theory subsumes a cognitive-motivational analysis of achievement-related behaviour that is consistent with the model of behaviour change adopted here. In the context of this model, attributional preferences about the causes of success and failure may be conceptualized as cognitive structures (parts of the self-concept "metastructure") that have their influence on children's self-perceptions and thoughts (inner speech), and, through these, their behaviour in achievement-related contexts. It can be demonstrated that the attributional model suggests

specific and testable hypotheses about the kinds of self-perceptions that may contribute to the motivational and performance deficits of children who experience reading difficulties.

The major variables and hypotheses in this research were derived from the cognitive-motivational analysis developed by Bernard Weiner and his co-workers at UCLA and from the literature on learned helplessness in children. Elaborating on the theoretical analysis of Heider (1958) and Rotter (1966), Weiner (1974) has proposed a two-dimensional taxonomy of the causes of success and failure that has received considerable attention in the literature. Four causes of success and failure; ability, effort, task difficulty, and luck are seen as falling along the dimensions of internality-externality, and stability-instability. Ability and effort are characteristics that are internal to the person, while task difficulty and luck are external factors. Additionally, ability and task difficulty are stable factors while effort and luck may be relatively variable from moment to moment and situation to situation. (The emphasis here must be on the word "relatively" since a lack of effort, for example, may take on stable characteristics, as in "a lazy person".) An impressive body of literature has shown that attributions of success and failure mediate a variety of achievement-related cognitions and behaviours (see Weiner, 1977, for a review relevant to the field of education). It was thought that an analysis of the perceived causes of success and failure of

children who vary in reading ability might advance our understanding of the self-perceptions and achievement behaviours of poor readers. Of particular interest were the relationships between cognitive expectancies, motivational variables, and causal perceptions.

A logical first question that must be posed in the analysis concerns the way in which causal cognitions are formed, or more specifically, how children of varying reading ability may come to acquire stable beliefs about the causes of their successes and failures in reading.

Development of causal perceptions

According to Weiner (1974), ability inferences are determined primarily by past history information. Repeated success or failure, or person-outcome covariation over time, in part indicates whether a person "can" or "cannot". For example, high grades in school are usually taken as an index of whether a child is "smart". Outcome information considered in conjunction with social norms (how many others in the reference group succeeded on the task) is particularly used to infer level of ability (see Frieze & Weiner, 1971; Weiner & Kukla, 1970). If, for example, a child fails at a task that most other children succeed at, then he or she is likely to perceive him or herself (and be perceived by others) as lacking ability.

This evidence suggests that those children who experience repeated failures in reading are more likely to see themselves, and be seen by others, as being less competent in reading. This

self-perception should reflect itself in these children's expectations of success on reading tasks, and also in their causal ascriptions of success and failure in reading. A hypothesis tested in this research was the expectation that the "poor" reader, relative to the "average" or "good" reader of equal intellectual potential (as measured by IQ scores), would more often attribute failure to the absence of ability, and success to factors other than ability.

Immediate outcome, past history and social norms also influence inferences about effort expenditure (Weiner, 1974). Those individuals with a history of repeated success perceive themselves and are judged by others as having tried harder than those who fail (Frieze & Weiner, 1971; Kukla, 1972; Weiner & Kukla, 1970). In addition, Frieze and Weiner (1971) showed that success, following a series of repeated failures, or failure following a series of successes, is in part attributed to increments and decrements in effort expenditure. Predictions in this research about children of varying relative reading ability follow from these findings. It was expected that poor readers, relative to average or good readers, would be more likely to ascribe successes in reading to increased effort, while average and good readers would be relatively more likely to attribute failures in reading to lack of effort.

Task difficulty is generally inferred from social norms and from objective task characteristics, such as familiarity with the vocabulary on a reading test (Weiner, 1974; Weiner & Kukla, 1970;

Frieze & Weiner, 1971). One might also speculate that factors such as self-esteem might distort the child's perception of the difficulty of a task. For example, on an objectively difficult task a child with low self-esteem may still ascribe failure to a lack of ability while attributing the failure of others on the same task to lack of effort. Assuming that poor readers are relatively less likely to attribute success in reading to the presence of ability (as we have predicted), then it follows that they would be more likely to attribute success in reading, when it occurs, to the ease of the task, thus maintaining a low self-concept of ability in reading.

Luck is usually inferred from perceived lack of control over outcomes and from variability in their sequence (Weiner, 1974).

Now, what of the consequences of these attributional self-statements? How might these perceptions influence achievement-related cognitions and behaviours and how, specifically, might such cognitive-behavioural relationships help us to understand the achievement behaviour of children of varying reading ability, especially the child with a reading difficulty?

Cognitive expectancies

It has been consistently demonstrated among adults that prior success or failure at a task influences the future expectancy of success, with expectancy increasing following success and decreasing following failure (see for example Diggory, 1966). Thus, one hypothesis of this research was that pupils with relatively good or average reading ability would have higher

expectancies of success than pupils of relatively poor reading ability, even though they would have similar potential (as measured by IQ scores).

The relationships between causal attributions and expectancy of success have also been demonstrated in numerous studies, both correlational and experimental in nature (e.g. McMahan, 1973; Valle & Prieze, 1976). In general, it has been found that causal attribution of an outcome to a stable factor, such as ability, increases the subjective probability of success after a success and decreases expectancy of success after failure more than do ascriptions to an unstable cause such as effort or luck. The implications for children of varying reading ability are straightforward. We have already suggested that children of relatively poor reading ability would be more likely to attribute failures to more stable factors such as lack of ability, and successes to factors other than ability, including both unstable (effort and luck) and stable factors (the ease of the task). Good and average readers on the other hand were hypothesized to ascribe failures to more unstable causes (especially effort) and successes to more stable causes (especially ability). An important prediction tested in this research, therefore, was that poor readers, relative to average and good readers, would display a much greater reduction in the subjective probability of success following failure and a moderate but somewhat lesser increment in their expectancy of success following successful outcomes.

Further support for these hypotheses derives from an examination of the relationship of self-concept to shifts in the expectancy of success as a function of success or failure outcomes. In fact, self-concepts can be shown to be relatively stable because of their direct linkages with expectancy of success (see Weiner, 1974; 1977). Let us say for example, that a child with a low expectancy of success (a poor reader) performs well on a reading test. Because this outcome is unexpected, the success is attributed to an unstable factor, such as good luck (see Feather, 1969). Thus, the subjective probability of success is not increased. If, on the other hand, this same child performs poorly on the reading test, has anticipated failure (the low initial expectancy), and when it occurs ascribes it to a stable factor such as low ability, subsequent expectancy of success would decrease even further! Inasmuch as success does not increase future expectations substantially, while failure lowers estimates of future success, a low self-concept is maintained. Conversely, let us look at the child with a relatively higher expectancy of success (a good or average reader). If the child succeeds on the reading test, the outcome is anticipated and so is attributed to a stable cause, such as high ability. Expectancy increases. If the child fails, then outcome is unanticipated and tends to be attributed to an unstable cause, such as lack of effort. Expectancy does not decrease substantially. In this manner a high self-concept and a high subjective probability of success is maintained.

Motivational variables

Causal attributions have been found to influence several indices of motivation including speed of performance, choice, and persistence of behaviour (see Weiner, 1974; Weiner & Sierad, 1975). Since persistence is such a crucial variable in learning, and since a lack of persistence has already been discussed as a commonly observed characteristic of children with reading difficulties, it was chosen as a variable worthy of study here.

Persistence of behaviour in the face of failure has been found to be associated with attributions of failure to lack of motivation (effort) (e.g. Dweck & Reppucci, 1973; Dweck, 1975). Attributions of failure to lack of motivation imply that failure is surmountable through increased effort, a factor that is generally perceived to be under the child's personal control. Conversely, lack of persistence has more commonly been shown to be associated with the attribution of failure to uncontrollable external factors. When children who give up easily do take responsibility for failure, they are more likely than persistent children to blame their lack of ability (Dweck & Reppucci, 1973). Attributions to external factors and to lack of ability imply that failure is difficult to overcome, particularly in situations where failure is the rule rather than the exception. Additionally, the literature suggests that higher expectations of success lead to greater persistence in the face of difficulty (Battle, 1965; Feather, 1968). Integrating these findings with the previous predictions made about the attributions of children

of varying reading ability, one would expect the poor reader to be relatively less persistent in the face of difficulty than an average or good reader.

Learned helplessness

Dweck and her associates have related persistence to the phenomenon of "learned helplessness". Originally derived from experiments with dogs, the construct of learned helplessness refers to a situation whereby an individual has learned over time that he or she has no control over the outcome of events (see Seligman, 1975). Research with humans has established a variety of cognitive and behavioural manifestations of this perceived independence of response and outcome. These have included passivity, lack of persistence in the face of failure, negative self-attitudes about intellectual performance and competence, and lower self-esteem (see Seligman, 1975 for a review and also Dweck & Reppucci, 1973). The parallels between this brief description of learned helplessness and the previous discussion of children with reading difficulties is striking. It suggests that such children may be victims of a similar phenomenon: that as a result of repeated failure in reading they perceive an independence between response and outcome that results in performance deficits unrelated to actual skill deficits in reading. In terms of their perceptions of causality, we have hypothesized that these children may attribute success to more external forces and failure to lack of ability or factors beyond their control. These perceptions are consistent with the findings of Dweck for

subjects in her studies who displayed "learned helplessness" (e.g. Dweck & Reppucci, 1973; Dweck, 1975). One aim of this investigation therefore, was to assess the possibility that relatively poor readers would display cognitions and behaviours that reflected learned helplessness in reading.

While it is not likely that learned helplessness is a general, pervasive phenomenon, it is probable that children develop such perceptions in specific areas of endeavour. Indeed Dweck and Reppucci (1973) showed that learned helplessness can be brought under stimulus control. Thus, a child displaying learned helplessness in reading may, or may not display similar behaviour in other academic subjects. Another aspect of this research therefore, was to assess the generality of poor readers' causal attributions, expectancies, and persistence on an academic task unrelated to reading.

Method

Subjects

Subjects were 123 Grade 5 boys from regular classes in four public schools located in primarily middle-class communities. All parents of these children had signed a letter of consent allowing their children to participate in a study of "factors that influence academic achievement".

Seventy-two boys were selected from the original sample. There were 24 good, 24 average, and 24 poor readers chosen on the basis of their scores on two forms of the Comprehension subtest

of the Gates-MacGinitie Reading Tests (Gates & MacGinitie, 1965), and two forms of the IPAT Culture Fair Intelligence Test (Cattell & Cattell, 1960) as explained below.

The age of subjects ranged from 9 years 9 months to 12 years 10 months with a mean age of 10 years 6 months. This particular age range was selected in order to reflect the results of developmental research that suggests that causal attributions and achievement-related expectancies do not exert stable influences on boys' behaviour until approximately 8-10 years of age (see Parsons & Ruble, 1977; Ruble, Parsons & Ross, 1976).

Selection of subjects

Children of relatively good, average, and poor reading ability were selected using the operational procedures developed by Willows (1978).

In the present sample the test-retest reliability of the scores on the two forms of the IPAT Culture Fair Intelligence Test was r (121) = .77, $p < .001$ while the test-retest reliability on the two forms of the Gates-MacGinites Reading Comprehension subtests was r (121) = .86, $p < .001$. A Pearson correlation of the mean reading comprehension and IQ scores yielded a coefficient of r (121) = .65, $p < .001$. Applying the correction for attenuation due to measurement error in the obtained reading and IQ scores (Ferguson, 1971), this correlation increased to r = .80. Since the IPAT is an entirely non-verbal measure of intelligence, it is probable that a correlation

between reading achievement and verbal IQ would have been higher still.

Since the test-retest reliabilities on IQ and reading were not very high, all subjects whose IQ or reading comprehension scores differed by one standard deviation or more were dropped from the original sample (a total of 27).

Willows (1974) has pointed out that since measures of reading ability and IQ share a large proportion of common variance (64% in the tests used in this research), it is important to control for IQ when defining groups of children on reading ability. In this study therefore, reading ability was operationally defined in terms of both reading achievement and intelligence test scores. Following the method developed by Willows (1978), each child's IQ score was used as a predictor of his reading potential, and his score on the reading test was taken as an index of reading performance. The size and direction of the discrepancy between predicted and obtained reading scores determined the assignment of children to good, average, and poor reading groups. Notice that this operational definition also satisfies one of the most commonly referred to criteria for defining a learning difficulty; that is, some apparent disparity between potential and performance (see Johnson & Morasky, 1977; Spache, 1976). As such, poor readers in this research may also be referred to as children displaying learning problems in reading.

This procedure for operationally defining a learning difficulty avoids some serious pitfalls of previous research. Most studies of learning difficulty groups have employed criteria such as "nomination by teacher", "clinical diagnosis", or "presence in a special class" in determining group membership. Given the extreme heterogeneity of that group of children referred to as manifesting a "learning disorder" such procedures leave us with a rather murky picture of the nature of the deficit under investigation. The present operational definition then, is employed in an effort to improve predictive validity from study to study.

The reading ability designation employed in this research was thus a relative one which relied both on the reading score and the IQ score. For example, in the present sample a child whose IQ was 81 and whose reading score was 50.5 was classified as a good reader while another child with an IQ of 122 and an identical reading score of 50.5 was designated a poor reader. Had these two subjects been assigned to reading ability groups on the basis of their reading scores alone they would both have been assigned to the same group. Using the operational procedures developed by Willows (1978) results in groups of children whose absolute reading scores overlap to some extent, but whose relative reading ability differs substantially.

Table 1 presents the means and standard deviations of subjects' age, IQ, and reading comprension scores as a function of the reading ability designation. A comparison of the mean age

and IQ scores of the three resulting groups revealed no significant differences ($F < 1$). The groups did differ significantly, however, in their reading comprehension scores, $F(2, 69) = 33.38$, $p < .001$.

Insert Table 1 about here

For the purposes of the experimental design described below, subjects were assigned to triads each containing one good, one average, and one poor reader with approximately equivalent IQ scores. There were 24 such triads for a total of 72 subjects.

Procedure

Subject's initial expectancies of success, peristence in the face of difficulty, causal attributions of success and failure, and shifts in expectancy of success as a function of outcome were assessed on two tasks in which success and failure were manipulated.

Each child was tested individually in a room in his school on two occasions separated by at least one week. The experimenter was blind to the level of reading ability of each child. On each of the two testing days subjects received either a task designated as a "reading test", or an unspecified task designated simply as a "test".

The "reading test" consisted of a series of 5 five-letter anagrams which previous pilot-testing had determined were equally solvable for children at all levels of reading ability (ospon,

hroes, chria, muoes, trnia). In the failure condition, a single letter in each anagram was changed so as to render the anagrams unsolvable (sopni, hrons, echru, muoas, atrne). Though anagram solution is not, strictly speaking, a reading task, it was employed here because of the ease with which outcome could be manipulated and also because children could easily be made to corstrue it as a test of reading ability.

The unspecified "test" consisted of a series of 5 line-drawings similar to those used by Weiner (1972), in which subjects are asked to trace over all of the lines of the puzzle without lifting the pencil or without retracing a line. Solvable and unsolvable forms of these puzzles can be constructed which are not discriminable to the naive subject. Pilot testing had confirmed the solvability and unsolvability of the 10 particular puzzles employed in this research. In addition to the obvious skill component of this task, the line-drawings were employed here because of the ease with which the procedures could be made to parallel those in the anagram solution task.

The order and outcome of these two tasks were counterbalanced with each subject serving as his own control. Task outcome was manipulated so that one half of the subjects experienced repeated success on both days, while the other half of the subjects experienced repeated failure on both days. The two levels of order x two levels of outcome yielded four experimental groups. Each of the triads of subjects was randomly assigned to one of the four groups. Statistical comparison of group means revealed

no differences between the groups on age, IQ, or reading comprehension scores; the analysis of variance in each case yielding an F-ratio of less than 1.

Each boy entered the designated testing room and was seated at a small table on a side adjacent to the experimenter. On the first day the experimenter introduced himself and began the session with some general instructions. subjects were told that they were there to aid the experimenter in finding out "how kids your age do on some puzzles" that he had brought with him. They were further informed that "we really don't know how children your age do on these puzzles so you might find them easy or hard" and also that they would be asked some questions about their performance afterwards. The reference to the difficulty of the puzzles was included for ethical reasons in order to minimize any enduring effects of repeated failure on the children. Additionally, each child in the failure condition received three solvable puzzles at the end of each of the two sessions. These procedures not only served to minimize any lasting effects of the failure experience, but also served to inhibit subjects in this condition from generalizing an expectancy of failure from Day 1 to Day 2 testing. In fact, every effort was made on the second day of testing to have all children see the two "tests" as different and unrelated. The instructions on Day 2 were similar to those of Day 1 except that the child was repeatedly informed that the new puzzles "have nothing at all to do with the ones you did last time."

Initial expectancy

Following the general instructions for the task, each subject was asked a question that was designed to provide a quantitative measure of the child's expectancy of success on the task that followed. Dweck and Gilliard (1975) had found that asking children to verbalize expectancy statements on a trial by trial basis was a significantly reactive measure that influenced children's persistence in the face of failure and also affected the course of their stated expectancies over trials. In contrast, asking the child to make expectancy statements before and after the entire set of trials was found to be no more of an influence on persistence than only asking an expectancy question at the end of the session. The latter procedure, soliciting an expectancy question before and after the set of all trials, was thus adopted for this research. The initial question was posed as follows:

> "In a few minutes you are going to take a (reading) test. In this (reading) test you will be asked to solve five puzzles or problems. I'll explain more about it soon, but first I would like to know how well you think you will be able to do on this (reading) test. How many puzzles do you think you will be able to solve? Do you think you will be able to solve none of them? One of them? two of them? three of them? four of them? or all of them? Point to the box on the card which says how many of them you think you will be able to solve."

At this point the child was presented with a 29.5 cm x 12.7 cm white formboard on which was printed a series of six 7 cm x 7 cm squares, each of which resembled the face of a die. The first square had no dots,, the second square had one dot, the third two

dots and so on. Printed beneath each square was a statement and a figure representing the number of dots which the die contained (e.g., none of them [0]; one of them [1]; two of them [2] etc.). The child pointed to the square of his choice and the expectancy score was recorded by the experimenter.

The specific instructions for the task to be administered on that day were then supplied. In each case a practice example was included in order to confirm the child's understanding of the task and also to induce the expectation that the puzzles to follow were indeed solvable. Additionally, within both instructional sets subjects were repeatedly encouraged to give up on any trial in which they thought they could not achieve success ("Remember, if you don't think you can get one, go on to the next one"). The specific procedures for the two tasks are described below:

Reading task

Following general instructions for solution of the anagram puzzles, the five anagrams were presented to the child in a random order printed on individual 20.5 cm x 12.7 cm cards. Upper case letters measured 3 cm while lower case letters measured 1.5 cm. The cards were placed in a pile face down directly in front of the subject who could go on to the next card as he wished. Scrap paper and pencils were available to those who wanted to use them. A stopwatch was used to measure the time to completion for each of the five solvable anagrams and the persistence time for each of the five unsolvable anagrams in the

failure condition. Time to completion was defined as the amount of time between the point at which the child turned over a card until a correct response was verbalized. Persistence time was defined as the amount of time between the point at which a card was turned over until the child rejected the card and pushed it aside, or turned over the next card. For the purposes of keeping the variability of scores within reasonable bounds, a time limit of 3 minutes per trial on both tasks was imposed. Pilot testing had determined this to be a sufficient amount of time for most subjects to give up on any one trial. Time was recorded by the experimenter following each trial. The mean time to completion and mean persistence time were calculated for each child on both tasks as the average of the five trials.

Unspecified task

Following general instructions for their solution, the five line-drawing puzzles were presented in a random order on 10.5 cm x 9 cm pieces of paper in a pile directly in front of the child. The puzzles themselves measured 4.5 cm x 4.5 cm. A large number of differently coloured pencils were also available to the subjects who could restart the puzzle as many times as they wished by using a differently coloured pencil. Procedures were identical to those in the reading task.

Causal attributions

Following completion of the task, subjects were asked to attribute their preceeding success or failure to one of four possible causes: ability, effort, task difficulty or luck. The

form of the question was similar for both the reading task and the unspecified task. The question was posed in the following way:

> "I would like to know why you think you did (did not do) so well on this test. Do you think you did (did not do) so well because you are (are not) good at this, because you tried hard (could have tried harder), because it was an easy (a hard) test, or because you were lucky (unlucky). Point to the card or cards which say why you think you did (did not) do so well on this test." (Phrases used in the failure condition are enclosed in brackets)

The four 20.5 cm x 12.7 cm cards on which the attributional statements were printed in first person format (upper case letters measured 3 cm, lower case letters measured 1.5 cm) were then placed in a random order from left to right directly in front of the child. After the child had pointed to a card the experimenter asked, "Any other?" The second choice was permitted in order to reflect the multiple determinancy of events in achievement situations. Subjects were not, however, required to make a second choice.

Expectancy shift

After the response(s) to the attribution question were recorded the experimenter then posed a final question designed to provide a quantitative measure of the child's reaction to his success or failure experience. The question, response, and recording procedures were identical to that employed in the initial expectancy measure except that the child was asked how well he thought he would be able to do if given "five more (reading) puzzles".

After the second day of testing had been completed in each school all children were debriefed and thanked for their cooperation.

Design

Scores on each of the four dependent measures (initial expectancy, time, attributions and expectancy shift) were subjected to a 3 x 2 x 2 x 2 analysis of variance employing a matched subjects, repeated measures design. Subjects at three levels of reading ability had been matched on their mean IQ scores in order to avoid a confound of nonverbal IQ with the reading ability designation. 'Reading level' (good, average, poor) and 'Day' (1, 2) thus served as the two within-subjects variables while 'Order' (1, 2) and 'Outcome' (success, failure) served as between-subjects variables. The order of the two tasks was counterbalanced, with subjects receiving only one of the tasks on each of the two days. Thus it was the interaction of Order x Day that represented the 'Task' variable (reading, unspecified) in the analyses.

Results

Initial Expectancy

The analysis of variance carried out on expectancy scores yielded a significant main effect for level of reader, F (2, 40) = 28.085, $p < .001$. Planned orthogonal contrasts revealed significant differences between good and average readers on the one hand, and poor readers on the other, F (1, 40) = 25.09, $p <$

.001, while the expectancy scores of good and average readers did not differ significantly, F (1, 40) = 3.00, $p > .05$. Inspection of the mean initial expectancy scores presented in Table 2 shows that expectancy decreased with lowered reading ability. That is, children of relatively poorer reading ability expected to solve fewer puzzles on both tasks than children of relatively higher reading ability.

Insert Table 2 about here

The main effect of reading level was qualified, however, by its higher order interaction with the task variable, F (2, 40) = 9.499, $p < .001$. Planned orthogonal contrasts carried out on the means revealed significant differences between good and average readers in their initial expectancies on the two tasks, F (1, 40) = 5.22, $p < .05$. Inspection of the means in Table 2 shows that there are essentially no differences between good and average readers on the unspecified task, the significant effect thus being due to differences between the two groups in their expectancies of success on the reading task, with good readers displaying the higher scores. That is, good readers were more confident of success on the reading task than were their average or poor counterparts. Poor readers differ significantly from both these groups, F (1,40) = 4.29, $p < .05$, displaying lower expectancies of success on the unspecified task and on the reading task. As shown in the table, while the direction of the

means is similar on both tasks, the Reading level x Task interaction is accounted for by the fact that there is a greater range of expectancy scores on the reading task, with poor readers displaying lower expectancies of success and good readers displaying higher expectancies of success than on the unspecified task.

The results clearly support the hypothesis that poor readers display significantly lower expectancies of success on the reading task as compared to average or good readers. Additionally, poor readers were shown to maintain relatively lower expectancies of success on a task unrelated to reading.

Task

The analyses of variance yielded no significant main effects or interactions with the task variable for either of the time, attribution, or expectancy shift measures. Essentially, the pattern of results was almost identical for both the reading and unspecified tasks. Unless otherwise noted then, the discussions that follow relate to subjects' mean scores on both tasks combined.

Persistence time

An analysis of variance performed on subjects' mean "time to completion" (success condition) and mean "persistence time" scores (failure condition) yielded a number of significant effects. Since time to completion and persistence time essentially measure two independent and conceptually different behaviours (one relates to competence, the other to motivation),

only interactions having Outcome as a component are interpretable here.

The interaction of Reading level x Outcome yielded a significant F-ratio, F (2, 40) = 21.816, $p < .001$. The means and standard deviations of children's time scores as a function of reading level and outcome are presented in Table 3. Planned orthogonal contrasts carried out on the means showed significant differences between poor readers relative to average and good readers, F (1, 40) = 21.665, $p < .001$, but no differences between average and good readers on the mean time scores ($F < 1$). Table 3 shows that the effect is primarily due to differences between the reading level groups in the failure condition, with poor readers giving up much sooner in the face of difficulty than average or good readers (who themselves do not differ in persistence time). The results provide clear support for the hypothesis predicting differences between poor vs. average and good readers in persistence time in the face of difficulty. In this study, good and average readers persisted an average 40% longer than poor readers.

Insert Table 3 about here

Attributions

Each of the child's attributions of success and failure on the two tasks was classified according to whether it was internal or external and stable or unstable. It was then scored on each

of two scales constructed to reflect the causal dimensions of success and failure proposed by Weiner (1974). In situations where the subject made a secondary attribution discrepant in classification from the first (for example, a primary attribution to an internal factor such as ability, and a secondary attribution to an external factor such as luck) additional weight was assigned to the first choice.

Two 4-point scales were constructed in the direction of increasing internality and increasing stability of the causal attributions. A "0" reflected an attribution that was completely external (both choices were classified as external or only one choice was made and that was classified as external) while a "3" reflected an attribution that was completely internal (both choices were classified internal or only one choice was made and that was classified as internal). A primary attribution to an external factor combined with a secondary attribution to an internal factor resulted in a score of "1". Similarly, a primary attribution to an internal factor in combination with a secondary attribution to an external factor resulted in a score of "2". The stability scale was scored in an identical fashion.

For example then, if a child made an initial attribution of his success at a task to ability (internal-stable) and then made a secondary attribution to luck (external-unstable) he would receive scores of 2 on the internality scale and 2 on the stability scale. Similarly, if the child attributed failure solely to lack of effort (internal-unstable), he would receive

scores of 3 on the internality scale and 0 on the stability scale. The internality and stability scores were then analyzed separately employing the design described earlier.

The analyses of variance yielded significant main effects for the outcome variable for both the internality and stability scale scores, F (1, 20) = 14.467, $p < .005$ and F (1, 20) = 23.497, $p < .001$ As expected, these main effects were qualified in both analyses by the significant interaction of outcome with level of reader. The F-test performed on internality scores yielded a ratio of F (2, 40) = 6.080, $p < .005$ for this interaction. The corresponding ratio for the stability scores was F (2, 40) = 3.168, $.05 < p < .10$. The mean internality and stability scale scores are presented in Table 4. Planned orthogonal contrasts were carried out on the two sets of means. Poor readers were found to differ significantly from average and good readers on the internality scale scores, F (1, 40) = 5.948, $p < .025$. Differences between poor vs. average and good readers on the stability scale scores approached significance, F (1, 40) = 3.065, $.05 < p < .10$. Average and good readers did not differ significantly on either scale ($F < 1$). Inspection of the means suggests that poor readers were more likely to attribute failures to internal and stable causes (e.g. ability) relative to average and good readers. In addition, poor readers appeared less likely to have internalized successful outcomes relative to their good and average counterparts, while not differing in the stability of causal attributions of success. These findings are consistent

with predictions. Poor readers were less likely to see themselves as personally responsible for their success and more likely to blame their failures on a lack of personal competence. A low self-concept of ability is indicated.

Insert Table 4 about here

An examination of subjects' causal attributions to the four possible causes of success and failure affords a clearer picture of the differences in attributional preferences in the three reading groups. In order to maintain consistency with the procedures employed for the scoring of the attribution data, primary attributions were arbitrarily assigned a weight of 2 while secondary attributions (second choice) were assigned a weight of 1. The weighted frequency of attributions in each cell was then divided by the total number of attributions (similarly weighted) made by the specific reading group to yield the proportion of attributions in each causal category. Table 5 presents the proportion of total attributions made in each causal category by each of the reading groups as a function of success and failure on both tasks combined.

Insert Table 5 about here

Comparison of the proportions contained in each cell across reading levels yields some striking differences. Poor readers,

relative to average and good readers, clearly take less responsibility for positive outcomes, mostly due to their relative reluctance to ascribe success to the presence of ability. Fifty-nine percent of the total attributions made by poor readers in the success condition were made to internal factors. The corresponding proportions for average and good readers were 77% and 84% respectively. Only 11% of poor readers' attributions of success were made to ability in contrast to 31% for average readers and 37% for good readers. In addition, poor readers appear to have attributed success to the external cause of task difficulty more often than average or good readers (30% for poor readers vs. 13% for both average and good readers). Attributions of successful outcomes to the presence of ability clearly indicate positive self-perceptions, while attributions of success to the ease of the task reflect more negative self-conceptions of ability.

With respect to the attribution of failure, the groups differ even more strikingly. Poor readers appear to have taken greater responsibility (internal factors) for failures than average or good readers, mostly due to their overwhelming tendency to ascribe failure to a lack of ability. Only 13% of average readers' and 12% of good readers' total attributions of failure were made to ability. For poor readers this proportion was 68%. In contrast, average and good readers, when they did attribute failure to internal factors, were relatively more likely to perceive lack of effort, an unstable cause, as being responsible

for their failure (28% for average readers, 29% for good readers, and only 2% for poor readers). Indeed, it can be seen that poor readers ascribed failure to stable causes more than 93% of the time compared with less than 60% for average and good readers. As has been stated, attributions of failure to stable factors imply that failure is more difficult to overcome, while attributions to unstable factors like effort imply that failure is surmountable. These attributional preferences conform to the predictions made for children of varying relative reading ability.

Expectancy shift

Subjects' scores on the expectancy shift measure were subtracted from their initial expectancy scores on the same task. This transformation resulted in deviation scores that reflected increments and decrements from subjects' initial estimates of success. A positive shift score denoted increases in the expectancy of success, while a negative shift score denoted decreases in the expectancy of success.

A significant main effect for outcome, F (1, 20) = 209.838, $p < .001$, resulted from the analysis of variance carried out on the deviation scores. Consistent with predictions, this effect was qualified by the interaction of outcome with level of reader, F (2, 40) = 4.777, $p < .025$. Table 6 presents the means and standard deviations for the shift scores as a function of reading level and outcome. Planned orthogonal contrasts revealed significant differences between poor vs. average and good readers

in their expectancy shift scores following success or failure, F (1, 40) = 4.100, $p < .05$, but no differences between average and good readers ($F < 1$). An inspection of the means in Table 6 shows that the significant difference is primarily due to poor readers' more negative shift scores following repeated failures.

Insert Table 6 about here

The finding is especially noteworthy in view of the conservativeness of the measure used here. Given that a finite scale of measurement was employed, poor readers' initially lower expectancies (see Table 2) allowed them less leeway to decrease their estimtes from initial levels than average or good readers who had initially higher expectancies (i.e. "floor effects"). The results were taken as supporting the prediction that poor readers display greater decrements in the subjective probability of success in the face of repeated failure than do children of relatively good or average reading ability. This finding implies that the poor readers in this study were more reactive to the failure experience, losing more confidence in their ability to attain future success than the average or good readers.

Further inspection of the means in Table 6 reveals rather small differences in the tendency to increase expectancies following repeated success. It was expected that poor readers would display lesser increments in the subjective probability of success following success than the other two groups. This

hypothesis was not supported by the data. In fact, Table 6 indicates that it was the good readers who displayed such a tendency. The results may be interpreted as being due to the greater influence of "ceiling effects" on the shift scores of average and good readers. Since their initial expectancies were relatively higher to begin with (M= 4.229 on a 5-point scale), good readers had very little leeway to increase their estimates of success from initial levels. The same was true for average readers relative to poor readers.

To summarize, the major findings of the analyses related to differences between children of varying relative reading ability on the measures employed. Generally, children of relatively poor reading ability were found to have: lower initial expectancies of success; given up more quickly in the face of difficulty; attributed failures to more internal and stable causes; attributed successes to more external causes; and produced greater decrements in their subjective estimates of success following failure, than children of relatively good or average reading ability. The generality of these differences on two tasks, one that related to reading and one that did not, was also demonstrated.

Discussion

The present research compared children who varied in relative reading ability on a number of cognitive and behavioural measures said to relate to self-concept. The aim of the investigation was

to determine some specific self-perceptions that might contribute to the motivational and performance deficits observed in children operationally defined as manifesting a reading difficulty. Major predictions were clearly supported by the data.

Expectancy

That poor readers have low self-concepts of ability in reading was reflected in their lower initial expectancies of success on the reading task. This lack of confidence in their ability to achieve success is most likely derived from previous failures in reading. The finding is not particularly surprising. Indeed, any different result, such as relatively higher initial expectancies of success for poor readers, would have prompted interpretations of defensiveness and distortion on the part of these children. Thus, the initial estimates of success for the poor, average and good reader groups can be said to reflect accurate and realistic statements of the probability of success based on these children's history of performance in reading. Of course, some objective measure of this history, such as school grades, would be necessary to rule out alternative explanations.

Of greater interest in this research is the finding that poor readers displayed greater decrements in the expectancy of success following failure in reading than average and good readers. Not only are these data consistent with the notion that poor readers have low self-concepts of ability in reading, they may also illustrate a greater reactivity on the part of poor readers to the failure experience. Simply stated, their confidence appears

more easily shaken, their ability to cope with failure less efficient than children of higher relative reading ability.

Taken together with the finding that poor readers were more likely to attribute failures to stable factors, especially ability, the data provide confirming evidence for Weiner's (1974) predictions concerning the relationship between expectancies and the stability of causal attributions. Moreover, these findings provide persuasive evidence for the hypothesized relationship of self-concept and expectancy shifts (Weiner, 1974; 1977). The poor reader failed, anticipated his failure and so ascribed the outcome to a stable factor (low ability). He then decreased his initially lower expectancy of success even further and thus maintained his low self-concept of ability. In contrast, the data show that the average and good reader tended to ascribe failure to more variable factors and did not substantially lower expectancies of future success as a function of failure in reading. In this way their relatively higher self-concepts of ability are maintained.

Persistence

Poor readers markedly lower persistence in the face of difficulty may be seen as a self-defeating behaviour, one that is integrally linked to the maintenance of a low self-concept of ability. Children who give up easily in the face of difficulty may never persist long enough at a task to discover that success may, in fact, be possible. Such children may never spontaneously discover that they do in fact possess the capacity to achieve

outcomes that exceed their expectations. When such children do succeed, it is likely to be at tasks that have lower difficulty levels. Such successes are far less self-reinforcing (and far less likely to be reinforced) than those associated with greater effort expenditure (Weiner, 1974). These data provide convincing evidence in support of the notion that children with reading difficulties may display an eroding motivation in achievement situations that increases the probability of future failure.

Attributions

The major predictions concerning the attributions of success and failure of children of varying relative reading ability were clearly supported by the data. Consistent with the idea that children with reading difficulties have a low self-concept of ability, poor readers were shown to take less personal responsibility for successful outcomes than average or good readers. Moreover, when they did infer an internal cause for success, poor readers were more likely to make effort attributions in contrast to average and good readers who displayed a clear tendency to attribute success to the presence of ability.

Differences between poor versus average and good readers were even more substantial with respect to attributional preferences for failure outcomes. The overwhelming tendency for poor readers to infer a lack of ability as cause indicates a self-perceived lack of competence on their part. Further, this particular attributional style is similar to that pattern of causal

inference that research has shown to reflect low need for achievement and low achievement motivation (Weiner, 1974; 1977). The preference displayed by poor readers to infer external causes for success and internal causes for failure has also been shown to minimize pride for success and maximize shame for failure in achievement situations (see Weiner, 1974). Future research might well endeavour to test these inferences through the use of objective measures of achievement orientation and measures of affective reactions to positive and negative outcomes. Empirical confirmation of such inferences in the population of children with reading difficulties would have important clinical and remedial implications.

Learned helplessness

The lack of persistence and causal attributions of success and failure displayed by poor readers in this study are consistent with an interpretation of learned helplessness as the term is employed in research with children (e.g. Dweck, 1975; Dweck & Reppucci, 1973; Diener & Dweck, 1978). In this respect, the present investigation lends some external validity to the use of the construct, since these behavioural and cognitive manifestations were demonstrated despite the lack of helplessness pre-training procedures. In the majority of studies which assess learned helplessness, including those with children, subjects are first exposed to varying amounts of helplessness training (varying proportions of failure to success trials). Cognitive and behavioural indices, said to reflect learned helplessness

(e.g. persistence), are then measured on a subsequent task. These studies therefore, in effect measure subjects' differential sensitivity to the helplessness training procedures employed in the design. They do not measure the extent to which subjects naturally manifest learned helplessness in some situation in their environment. The present study sought to assess the presence of learned helplessness as it naturally occurred in the population of children with reading difficulties, as opposed to measuring these children's sensitivity to helplessness inductions.

One major rival explanation of the results of this study derives from a recent theoretical paper by Bandura (1977). Bandura points out that lack of persistence is also a behavioural manifestation of a perceived lack of "self-efficacy"; that is, a perceived inability to produce the response necessary for a positive outcome to occur. Attributions of failure by poor readers to lack of ability, and attributions of success by average and good readers to the presence of ability may also be predicted from this notion of "self-efficacy". The response impotence implied by a perceived lack of self-efficacy reflects a distinctly different self-perception from that which derives from the theory of learned helplessness as it was originally defined by Seligman (1975). In learned helplessness the subject is said to be capable of producing the necessary response but does not do so because he or she perceives an independence between response and outcome. Responding appears "useless". According to the

self-efficacy notion, the subject would respond if only he or she knew how. In the present research it remains unclear whether the responses displayed by poor readers reflect either learned helplessness or a perceived lack of self-efficacy. However, since the two theories do not appear to result in differential predictions about the variables under consideration in this study, such a distinction of underlying cause is not considered to be critical. Indeed, it appears to the present authors that the use of the term "learned helplessness" in relation to studies of children has derived more from similarities in the cognitive and behavioural manifestations than from hypotheses about the underlying causes. Therefore, learned helplessness as it is referred to in this research is a descriptive term that may derive either from a perceived lack of ability to produce the particular response or an acquired belief in the uncontrollability of outcomes. The critical considerations here are the specific expectancies, self-perceptions, and achievement behaviours that relate to the child's reading performance, and whether and how these may be modified. Future research, however, might well be directed at distinguishing between these two underlying processes and determining what differential implications, if any, they may have for strategies of behaviour change.

Generality of expectancies, attributions, and persistence

Several rival hypotheses may be offered to account for the lack of task differences displayed in the data on expectancy

shifts, attributions, and persistence. One obvious possibility is that the three groups of readers did indeed exhibit a generality of self-perceptions across both the reading and unspecified tasks. In this case then, one might infer that the learned helplessness or lack of self-efficacy displayed by poor readers was not specific to the deficit area, but was general across academic tasks. Given that learned helplessness and self-efficacy have been shown to be discriminative and situationally specific (Dweck & Reppucci, 1973; Bandura, 1977), such an interpretation has major implications for the overall academic functioning of children with reading difficulties. It may be that there are a significant number of children in regular classes who are functioning at levels below intellectual potential in numerous academic subjects in addition to reading. Many of these children would probably go undetected since they would be achieving at "average" grade levels.

A second possible interpretation of these data concerns the actual procedures employed in this research. Although efforts were made in this study to have children perceive the two tasks as separate and unrelated (e.g. separate days, direct instructions that the second task had nothing to do with the first), the experimenter was indeed the same and the actual procedures for the two tasks quite similar. Given these circumstances, it is difficult to rule out an explanation pertaining to the generality of situations, as opposed to the generality of self-perceptions. In order to test this

possibility the data from Day 1 only was subjected to an analysis of variance. The design was identical to that employed in the previous analyses except that Task was treated as a between- instead of a within-subjects variable. The results were similar to those in the original analyses with the same main effects and interactions emerging as significant. Although the finding effectively rules out this latter explanation, future research should be careful to employ different experimenters and procedures for each task in the design.

Implications for education and reading remediation

In a recent chapter, Willows (in press) discusses a "hardware-software" distinction in reading performance. The argument for this distinction is generally as follows: In accounting for the variance in predicting reading performance it has repeatedly been shown that some 50% may be attributed to intellectual capacity--some basic and more or less invariant skills are necessary for proficient reading performance. (In the present research this hardware component was represented by children's IQ scores as assessed by Cattell's test of "g".) It is also known that another 50% of the variance is not accounted for by non-verbal intellectual endowment--we know this since reading is indeed a teachable skill and that children can be taught to improve their performance on reading tasks. The software component thus refers to those variables contributing to reading performance that may change over time as a function of personal or environmental factors. It is to this software component that

the majority of successful remedial efforts have been directed since research has shown that efforts to raise children's IQ have been largely unsuccessful (e.g. Westinghouse Learning Corporation, 1969). The present investigation, in effect, represented an attempt to determine some of the variables in this software component. Cognitive expectancies, attributions of success and failure, and persistence were thought to be variables influencing reading performance that had greater plasticity and greater potential for modification.

A number of recent investigations have been successful in demonstrating that children's achievement behaviour may be altered by modifying their causal attributions of success and failure (e.g. Dweck, 1975; Andrews & Debus, 1978). In general, the strategy has been to induce children to change their attributions of failure from perceived lack of ability to perceived lack of effort. Increases in expectations of success, persistence, and the number of successes have been found to result from such attempts at modifying children's cognitions. In one study of particular relevance, Chapin and Dyck (1976) showed that attribution re-training was successful in increasing the persistence of poor readers and in increasing the number of difficult reading tasks they would attempt.

These findings have clear implications for interventions that may serve as a valuable adjunct to the more traditional techniques of remediating reading difficulties. By modifying what poor readers say to themselves about their performance we

may potentially effect increases in their motivation, persistence, and expectancies of success in reading. The relative effectiveness of such techniques in enhancing reading performance is certainly open to empirical verification.

One critical implication of the above discussion is that educators must begin to reconceptualize failure as a necessary component of the learning process, and not as a damaging experience to be avoided. Not only must remedial efforts be directed at providing positively reinforcing success experiences for children with reading difficulties, they must also be directed at teaching these children to think more adaptively about their failures. As such, failure must effectively be built into remedial programs. Support for these contentions derives from a number of studies that showed that "success only" experiences were not as effective in inducing lasting behaviour change as the combination of success and failure and attribution re-training (Chapin & Dyck, 1976; Dweck, 1975).

Finally, the operational definition of a reading difficulty offered here is considered to be an important contribution to the literature on learning difficulties. In interpreting the findings of this investigation it is important to remember that statements about poor, average and good readers are statements about children who, although matched on non-verbal intelligence across groups, within groups represent a broad range of IQ scores, from those children who fall in the "dull normal" category, to those whose scores represent "very superior" non-

verbal intellectual capacity. The research reported here thus represents a study of those factors that may modulate the performance of children of varying reading potential. In essence then, this investigation was an attempt to elucidate some of the processes that contribute to that disparity between potential and performance that underlies the definition of a learning difficulty.

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Footnotes

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Requests for reprints should be sent to Irwin S. Butkowsky, Department of Psychology, University of Waterloo, Waterloo, Ontario, Canada, N2L 3G1.

Table 1

Means and standard deviations of good, average, and poor readers on age, IQ, and reading comprehension

	Good readers		Average readers		Poor readers	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Age	10.36	.45	10.22	.30	10.40	.76
IQ	111.19	11.95	110.54	11.88	110.75	11.30
Reading Comprehension	60.19	6.99	52.19	5.72	45.17	6.35

Table 2

Means and standard deviations of subjects' initial expectancies as a function of level of reader and task

	Good readers		Average readers		Poor readers	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Unspecified task	4.083	.776	4.042	.550	3.458	.600
Reading task	.375	.576	3.750	.676	3.000	.348
Both tasks	4.229	.625	3.896	.531	3.229	.531

Table 3

Means and standard deviations of subjects' time per trial as a function of level of reader and outcome

	Good readers		Average readers		Poor readers	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Success	29.445	23.116	25.036	10.983	22.178	10.897
Failure	161.146	14.492	162.495	18.139	97.077	30.627

Table 4

Means and standard deviations of subjects' internality and stability scores as a function of level of reader and outcome

Internality

	Good readers		Average readers		Poor readers	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Success	2.500	0.477	2.333	0.807	1.917	1.084
Failure	1.167	0.835	1.250	0.812	2.208	0.811

Stability

Success	1.375	1.110	1.208	1.076	1.167	0.862
Failure	1.708	0.865	1.792	0.838	2.833	0.326

Table 5

Weighted proportions of subjects' total attributions to each causal category as a function of level of reader and outcome

	Good readers	Average readers	Poor readers
Ability			
Success	.371	.311	.111
Failure	.118	.134	.678
Effort			
Success	.468	.459	.476
Failure	.294	.284	.017
Task difficulty			
Success	.130	.131	.302
Failure	.441	.448	.254
Luck			
Success	.032	.098	.111
Failure	.147	.134	.051

Note: First choice attributions assigned a weight of 1.0 and second choice attributions assigned a weight of 0.5.

Table 6

Means and standard deviations of subjects' expectancy shift scores as a function of level of reader and outcome

	Good readers		Average readers		Poor readers	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Success	0.292	0.498	0.792	0.542	0.667	0.651
Failure	-1.375	0.678	-1.333	0.937	-2.208	0.656